

Burns and Control of Infections–Nurses Responsibility: A Systemic Review

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Abstract

In today's life, despite the recent advancements, notable risks yet threaten human beings, like the risk of burns which accounts for a high mortality in developed countries and leaves several people disabled. Burn is an event that injures a huge number of victims each year and imposes irreplaceable physical, psychological, mental, economic, and social consequences, and even death. Burn patients need years of rehabilitation, surgery, and mental and psychological support. In recent years, numerous efforts have been made to prevent burns, such as conducting epidemiological studies, by which necessary interventions are purposefully administered in the treatment of burns. Burns are immediately or potentially life-threatening injuries. Patients with burn injuries are characterized by presence of , or being at high risk of developing life threatening problems due to the rapidly changing physiologic status, number of supportive devices and the multiple potential complications. Infection is one of the main complications among burned patients. The major part of nurses' role during burn care is detecting and preventing infection

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A burn is an injury to the skin or other organic tissue primarily caused by heat or due to radiation, radioactivity, electricity, friction or contact with chemicals. Skin injuries due to ultraviolet radiation, radioactivity, electricity or chemicals, as well as respiratory damage resulting from smoke inhalation, are also considered to be burns.

Globally, burns are a serious public health problem. An estimated 265 000 deaths occur each year from fires alone, with more deaths from scalds, electrical burns, and other forms of burns, for which global data are not available.

Over 96% of fatal fire-related burns occur in low- and middle-income countries. In addition to those who die, millions more are left with lifelong disabilities and disfigurements, often with resulting stigma and rejection.

The suffering caused by burns is even more tragic as burns are so eminently preventable. High-income

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countries have made considerable progress in lowering rates of burn deaths, through combination of proven prevention strategies and through improvements in the care of burn victims. Most of these advances in prevention and care have been incompletely applied in low- and middle-income countries. Increased efforts to do so would likely lead to significant reductions in rates of burn-related death and disability.

Burn injuries are among the most devastating of trauma/all injuries and a major public health concern around the world (Qader & Muhamad, 2010). The worldwide incidence of burn-related injuries in 2004 was estimated to be 1.1 per 100,000 populations, with the highest rate in Southeast Asia and the lowest in the Americas. The incidence of burns in low and moderate income countries (LMIC) is 1.3 per 100,000 population compared with an incidence of 0.14 per 100,000 population in high income countries (WHO, 2008). Additionally Peck (2012) indicated that approximately 90% of burn injuries occur in low middle income countries. Burn patients are at high risk of developing nosocomial infection because of their destroyed skin barrier and suppressed immune system, compound by prolonged hospitalization and invasive therapeutic and diagnostic procedures. Nosocomial infections are one of the most common complications affecting hospitalized patients and

contribute to excess morbidity and mortality (Azimi, Motevallian, Namvar, Asghari & Lari, 2011). Nosocomial microorganisms can originate from the patients themselves or from hospital environment, may also be acquired by health personnel working in the facility (Berman and Snyder 2012),

The main signs of wound infection are dark brown, black, or violaceous discoloration of wound which can be focal, multifocal, or generalized, as well as conversion of partial-thickness injury to full-thickness necrosis and hemorrhagic discoloration of subeschar tissue. Edema and/or violaceous discoloration of unburned skin at wound margins (most commonly seen with *Pseudomonas* infections) and unexpectedly rapid slough of eschar, most commonly due to fungal infection, are other well-known signs. There are three accepted forms of burn wound infections: (1) Cellulitis; (2) Invasive wound infections within unexcised eschar (necrotising infection-fasciitis); and (3) Burn wound impetigo.

The mode of infection transmission may be by contact, droplet or airborne spread. Modern burn centers have a contained perimeter that is designed to minimize the unnecessary traffic of health care workers and visitors. Modern infection control practice requires strict compliance with a number of environment control measures that include hand washing and the use of personal protective equipment. All personnel must be gowned (either disposable or reusable gowns) during the contact with the patient. All equipment in the isolation room must be regularly cleaned.

With universal employment of early excision and grafting, a burn wound transforms to an open burn-related surgical wound. This means that open burn-related surgical wound infection (SWIs) get more clinical attention than bacterial colonisation of an unexcised wound. New refinements of the standardized definitions for infection and sepsis in burn patients have been proposed by many authors. They assert that suspicious systemic infection (sepsis) should be considered as a clinical syndrome defined by the presence of signs and symptoms of systemic infection even with negative blood microbial cultures. It was recommended that systemic infection should be identified according to positive blood microbial culture or clinical response to antimicrobials.

Burn wounds often involve contiguous areas of open soft tissues wounds that are the result of direct tissue loss, degloving injuries, or surgical debridement. Wounds of this nature are left open for serial debridement and until definitive coverage or closure can be performed. In many cases, negative

pressure wound dressings such as the vacuum-assisted closure dressings that use open-pore foam are ideal.

Techniques used in wound cleansing include high-pressure irrigation, swabbing, low-pressure irrigation, showering, bathing and washing the affected area under a running liquid or total immersion in a whirlpool bath. A variety cleansing liquid are used including water, saline and antiseptic solutions. Most of these antiseptic solutions are toxic to fibroblasts and keratinocytes are some patients may be sensitive to some wound cleansers. Catheter tips are susceptible to colonization through hematogenous seeding of organisms from the colonized burn wound.

The control and prevention of infectious diseases among burned patients present a greater and more specialized problem, because the skin barriers are disrupted, the environment in burn units can become contaminated with resistant organisms, and these organisms can be transmitted easily from one patient to another. Thus, a well conducted surveillance, infection control and prevention program can help reduce the incidence. It is known that effective surveillance and infection control may reduce infection, mortality rates, length of hospitalization and associated costs

Optimal care of the burn patient requires a distinctive multidisciplinary approach. Positive patient outcomes are dependent on the composition of the burn care team and close collaboration among its members. At the center of this team is the burn nurse, the coordinator of all patient care activities. The complexity and multisystem involvement of the burn patient demand that the burn nurse possess a broad-based knowledge of multisystem organ failure, critical care techniques, diagnostic studies and rehabilitative and psychosocial skills. The nurse oversees the total care of the patient, coordinating activities with other disciplines such as occupational and physical therapy, social services, nutritional services and pharmacy. At the same time, the burn nurse is also a specialist in wound care. As a burn wound heals, either spontaneously or through excision and grafting, the nurse is responsible for wound care and for noting subtle changes that require immediate attention, prevention of infection and pain management.

Burn care nurse must not only continue to learn about the new advances required in burn care, but should also participate actively in learning skills for developing their inner knowledge, intuition, and wisdom as well as the discipline to integrate such skills into daily practice (Ali, 1995 & Aron, 1996).

Smeltzer and Bare (2010) mentioned that although sophisticated technology is an integral part of medical care, there is an emphasis on bedside clinical care which remains a key component of the burn care. The major part of nurses’ role during burn care is detecting and preventing infection. The nurse is responsible for providing a clean and safe environment for closely scrutinizing the burn wound to detect early signs of infection. In this regards, infection control in burn unit may be stressful, challenging and rewarding experience. It may be stressful because of many skills, procedures and responsibility demanded by the burn care nurse. It may be a challenging because nurses play an essential role in the bio-psychosocial assessment and management of their patients, caring for such patient may also be rewarding because it gives nurses an opportunity to demonstrate their understanding of holistic nursing care (Harkens & Dinchher, 1998; Greenfield, 2010). However, there is evidence that management and care of patient with burn injury requires a unique body of knowledge and skills from a range of multidisciplinary team members especially the nurse, and encompasses a wide variety of roles and responsibilities, mainly prevention of infection.

Aim

To review various studies to identify the Nurse’s responsibility and nursing care provided to the burns patient in view of prevention of infection or control of nosocomial infections.

Material and Methods

The systemic review was conducted using the wide level of literature of the subject of study which are

published in research papers from different sources such as original articles, e journals, and electronic data base as pubmed, Nursing research studies links, published and un-published dissertations and the google search using the different title topics. The search of literature was archived by searching the references using the keywords related to topics as burns, Nurses role, nursing care of burns patient prevention of infection of burns. Only the articles written in English is used for review.

Inclusion Criteria

- Studies conducted on burns patient care
- Studies conducted on infection control measures for burns patient .
- Studies conducted on nurses knowledge regarding infection control measures for burns patients
- The studies were available in English.
- Exclusion criteria
- Studies on burns and plastic/reconstructive surgeries.
- Studies on infection control measures of hospital

Results

The various studies which has been used to review the burns patient on infection prevention and methods to control the infections. The studies reviewed categorized under study on population as burns patient, infection control, nurses responsibility, nursing education activites towards the care of burn’s patient . The results reviewed are as below.

Category	Remarks
Nosocomial infections of burns patient	High risk group ,severely affected 14-18%
Reason or mortality of hospitalized burns patient	Most common cause is Septicemia
Infection control practices for nurses	Aspetic technique while conducting nursing proceduresand other procedures, detecting bacterial growth in perdic interval, disinfecting the environment,isolation of patient ,following standard precautions.
Nurses knowledge and practice	Positive correlation

Discussion

Infection can lead to deterioration of the wound healing process and severe systemic complications and is the leading cause of morbidity and mortality

in patients with burns. In recent years, nosocomial infections have reached epidemic proportions and are one of the main concerns in the health care arena. A continuously increasing prevalence, 10% of patients on general hospital units will acquire a nosocomial infection during their hospital stay. This

warning alarm raises the necessity for qualifying and updating knowledge of health care providers who carry out the clinical responsibilities while providing an optimal quality of level of patient care. Regarding the nurses' knowledge about hand washing, many studies illustrated a significant difference between nurses' knowledge and their practice. Hand hygiene is the first initial step towards successful infection control in any healthcare setup. Although the results found that most of nurses 90% had unsatisfactory level of practice regarding hand wash more than half of them had satisfactory knowledge level more than 75%. Many research studies stressed that meticulous use of medical and surgical asepsis is necessary to prevent transport of potentially infectious microorganisms. For example, many nosocomial infections can be prevented by using proper hand hygiene techniques, environmental controls, and sterile technique. The problem of infection can be avoided using strict aseptic technique while providing patient care. The present study findings indicated that study subjects' practice scores for starting and keeping IV infusion and following principles of asepsis were low.

The quality of nursing care depends to a large extent on the knowledge, skills, attitude and activities of the practicing nursing staff. The results of this study clarified that nurses' practice in relation to prevention of infection while providing care to burned patient was low.

Conclusion

The nurse plays a crucial role in preventing infection among the burned patients. Therefore the finding of this study and nurses follow the nursing

guide line are going to help in prevent infection and consequently enhance the quality of nursing care. Regarding research, the study findings also may provide basis for other researchers who would want to carry out further research on infection prevention and control principles. The burn ward nurses be taught continuous educational courses on the prevention of septicemia and psychiatric nursing care given to the burn patients. The committees of periodic infection control assessment in the hospital are suggested to inspect the bacteria that are resistant to routine antibiotics.

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